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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/596,619	06/19/2006	Johan Nystrom	P18772US1	8482
27045	7590	12/30/2008	EXAMINER	
ERICSSON INC. 6300 LEGACY DRIVE M/S EVR 1-C-11 PLANO, TX 75024			JAMA, ISAAK R	
			ART UNIT	PAPER NUMBER
			2617	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/596,619	NYSTROM ET AL.	
	Examiner	Art Unit	
	ISAAK R. JAMA	2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 33-64 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☐ Claim(s) 33-50 and 52-64 is/are rejected.
- 7) ☐ Claim(s) 51 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>06/19/2006</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 33-64 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Number 7,184,703 (Naden et al.) in view of U.S. Patent Number 6,239,748 (Gilhousen).

3. Regarding claims 33, 52, 55, 60 and 63, Naden teaches a wireless relay based network, comprising: a first node; at least one relay station; and a second node; wherein said first node communicates with said second node via said at least one relay station **[Column 2, lines 44-46]**, wherein each relay station is operative to: receive a digital communication from said first node; compute a plurality of reliability values for a plurality of symbols in the received digital communication **[Column 6, lines 29-39; Naden teaches that the relay equipment determines signal-to-noise ratio and uses CINR and RSSI to approximate the SINR]**. But Naden fails to explicitly teach that the reliability information is transmitted to the second node. Gilhousen teaches a method and system for determining the position of a mobile radio whereby a base station that received a signal from a mobile station, amplifies and demodulates the signal and provide a receive signal strength indicator (RSSI) signal to a controller. The controller then relays the RSSI signal along with other signals to the MTSO for use in the

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calculation of the mobile station's position [**Column 6, lines 31-38; i.e. embedding a reliability value (RSSI) in the relayed signal**]. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the method of Gilhousen into the relay system of Naden in order for the receiving node to decide whether to process the relayed signal or not.

4. Claims 34, 36, 37, 53, 54, 61 and 62 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Number 7,184,703 (Naden et al.) in view of U.S. Patent Number 6,239,748 (Gilhousen) and further in view of U.S. Patent Number 7,236,591 (Sim).

5. Regarding claims 34, 54 and 62 Naden and Gilhousen teach the limitations of claims 33, 52 and 60 above. But Naden and Gilhousen fail to teach is the use of a maximum a posteriori (MAP) filter that computes reliability values for code symbols based on a code structure of the received digital communication. Sim teaches a method for performing turbo decoding in mobile communication systems whereby in order that the input code words iteratively pass through two convolutional decoders, the two convolutional decoders should have output values corresponding to soft decision values having a probability rate of "0" or "1," not hard decision values such as "0" or "1." To obtain such soft decision values, a Maximum a Posteriori (MAP) decoding method is used, in which a posteriori probability value of a data bit is calculated and the data bit is decoded to obtain the maximum posteriori probability value [**Column 1, lines 32-40**]. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the method of Sim into the combined system of

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Naden and Gilhousen in order to measure the likelihood that the received bit is a soft bit, i.e. a 0 or 1.

6. Regarding claim 36, Naden and Gilhousen teach the limitations of claim 33, above. But Naden and Gilhousen fail to teach that each relay station performs the computing operation using a soft output channel decoder that computes reliability values for information symbols based on a code structure of the received digital communication. Sim teaches that in order to obtain soft decision values, a Maximum a Posteriori (MAP) decoding method has been suggested, in which a posteriori probability value of a data bit is calculated and the data bit is decoded **[Column 1, lines 36-38]**.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the method of Sim into the combined system of Naden and Gilhousen in order to obtain the maximum posteriori probability value.

7. Regarding claims 37, 53 and 61, Naden and Gilhousen teach the limitations of claim 36, 52 and 60 above. But Naden and Gilhousen fail to teach a soft output channel decoder employs: a maximum a posteriori (MAP) algorithm; a soft output Viterbi algorithm (SOVA); a Log-MAP algorithm; or, a Max-LOG-MAP algorithm. Sim teaches that the primary decoding and the secondary decoding are iterated for a certain number of times using a Maximum a Posteriori (MAP) algorithm, so as to reduce the receiving error rate **[Column 3, lines 24-27]**. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the method of Sim into the combined system of Naden and Gilhousen in order to obtain the logarithm of the ratio of the a posteriori probability of each bit.

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8. Regarding claim 35, Naden further teaches that each MAP filter also filters the received digital communication and redistributes noise to unreliable parts in the transmitted digital communication **[Column 3, lines 21-26; Naden discloses that the relay equipment selects from the plurality of signals they receive from source equipments those which are of the highest quality in terms of (SINR), (CINR) or RSS to relay to destination equipments thereby minimizing noise amplification].**

9. Claims 38-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Number 7,184,703 (Naden et al.) in view of U.S. Patent Number 6,239,748 (Gilhousen) and further in view of U.S. Patent Number 5,115,224 (Kostusiak et al.).

10. Regarding claims 38-43, Naden and Gilhousen teach the limitations of claim 33, above. But Naden and Gilhousen fail to teach that the computed reliability values are embedded in the transmitted digital communication. Kostusiak teaches a personal security system network whereby each receiving transceiver will transmit a relay signal, which combines (i.e. embeds) the emergency signal with additional received-signal-strength indication (RSSI) information **[Column 3, lines 37-39]**. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the method of Kostusiak into the combined system of Naden and Gilhousen in order to ascertain how far the transmitting unit is from the receiving unit.

11. Claims 44-49 and 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Number 7,184,703 (Naden et al.) in view of U.S. Patent Number 6,239,748 (Gilhousen) and further in view of the Applicant's admitted prior art.

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12. Regarding claims 44-49, Naden and Gilhousen teach the limitations of claim 33, above. But Naden and Gilhousen fail to teach that first node is: a base station; a mobile station; or, a relay station; second node is: a base station; a mobile station; or, a relay station; each relay station is: a base station; a mobile station; or, a stand alone relay station; that the received digital communication is: an uplink received digital communication; a downlink received digital communication; a base station peer-to-peer received digital communication; or, a mobile station peer-to-peer received digital communication, and that the transmitted digital communication is: an uplink transmitted digital communication; a downlink transmitted digital communication; a base station peer-to-peer transmitted digital communication; or, a mobile station peer-to-peer transmitted digital communication. Applicant's admitted prior art discloses that relay based networks include one station (node A) that transmits information in coded and modulated digital communications to another station (node B) via one or more relay stations (RSs). The relay station can be part of a base station (BS), a mobile station (MS) or a stand-alone relay station. The nodes A and B can be a BS, a MS and/or a relay station. And, the digital communications could be either uplink communications (link from MS to BS), downlink communications (link from BS to MS), MS to MS communications or BS to BS communications **[Page 1, paragraph 0004]**. and in regard to claim 49, the Applicant's admitted prior art teaches that when multiple relay stations each transmit the digital communication then said second node combines the transmitted digital communications **[Figure 5; #s 506 (a) and (b) and 504, pages 1 &2, paragraph 0009]**. In addition, and in regard to claim 58, the Applicant's admitted prior

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art teaches that the second link generally has a larger bandwidth and uses a different air interface protocol than the first link **[Page 1, paragraph 0008]**. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have that the relay based networks include one station that communicates with another via a relay that may be a mobile, a base station or an stand-alone repeater, and to have the receiving node combine multiple relay signals. And that the bandwidth allotted between the relay and the destination node is greater than the bandwidth between the transmitting node and the relay in order to accommodate any additional information that may be required by the receiving node.

13. Regarding claim 50, Naden further teaches that when one relay station transmits multiple digital communications at different times then said second node combines the transmitted digital communications **[Figure 2, column 11, lines 5-20]**.

14. Regarding claim 57, Naden further teaches that the relay station is used in a wireless multi-hop network **[Column 2, lines 28-32]**.

15. Regarding claim 58, Naden teaches that a link between said relay station and said first node has a smaller bandwidth than a link between said relay station and the second node.

16. Claims 56 and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Number 7,184,703 (Naden et al.) in view of U.S. Patent Number 6,239,748 (Gilhousen) and further in view of U.S. Patent Number 7,130,601 (Khorram).

17. Regarding claims 56 and 64, Naden and Gilhousen teach the limitations of claims 33, 52 and 60 above. But Naden and Gilhousen fail to teach that the computed

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reliability values are implicitly embedded in the coded/modulated digital communication transmitted to the second node. Khorram discloses a method for determining received signal strength in a direct conversion receiver whereby the RSSI value (reliability value) includes the amplitude modulation **[Figures 4-7, Column 6, 63-65]**. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the method of Khorram into the combined system of Naden and Gilhousen in order to transmit a more robust signal to the receiving node.

Allowable Subject Matter

18. Claim 51 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent Number 6,459,725 (Baker et al.) teaches a wireless repeater with improved diversity. U.S. Patent Number 6,385,462 (Baum et al.) teaches a method and system for criterion-based adaptive power allocation. U.S. Patent Number 6,859,656 (Choi et al.) teaches a method and apparatus for optimizing transmission power of a network. U.S. Patent Number 7,042,963 (Raith et al.) teaches a method and apparatus for decoding variably-coded signals based on prior communication.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ISAAK R. JAMA whose telephone number is (571)270-5887. The examiner can normally be reached on 7:30 - 5:00 M-F.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lester G. Kincaid can be reached on (571) 272-7922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/IRJ/

/Lester Kincaid/

Supervisory Patent Examiner, Art Unit 2617